



Department of Veterans Affairs Office of Inspector General

Healthcare Inspection Alleged Telemetry Unit Deficiencies VA New York Harbor Healthcare System New York, New York

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Executive Summary

The VA Office of Inspector General (OIG) Office of Healthcare Inspections conducted an inspection to determine the validity of an allegation regarding the quality of patient care on a telemetry unit at the Manhattan Campus of the New York Harbor Healthcare System, New York, NY. Specifically, the complainant alleged that a possible equipment malfunction or a lack of continuous telemetry monitoring might have contributed to a patient's death in June 2011. During the inspection, we also reviewed progress on corrective actions taken to address deficiencies related to a prior incident on another telemetry unit 6 months earlier, which the OIG addressed in an October 2011 report.

We did not substantiate that there was an equipment malfunction. We found that the telemetry equipment was functioning properly at the time of the incident and that biomedical engineering staff conducted preventive maintenance in accordance with manufacturer's specifications.

We substantiated that staff on the telemetry unit failed to respond to a patient's disconnected telemetry lead in a timely manner. The patient's telemetry status was not effectively monitored at the time of his death due to a lack of awareness of the disconnected lead.

Facility managers conducted a thorough internal review of the incident, and in response to those findings and previous OIG recommendations, developed a comprehensive corrective action plan to include revision of policies and procedures on all telemetry units, ensuring continuous monitoring of central telemetry stations. The action plan also addressed improving documentation and system-wide retraining of telemetry staff. We concluded that the newly developed corrective action plan addressed all identified deficiencies. Because facility managers had made significant progress in all elements of the corrective action plan, we made no recommendations.

The Veterans Integrated Service Network and Facility Director concurred with the report. No further action is required.



DEPARTMENT OF VETERANS AFFAIRS
Office of Inspector General
Washington, DC 20420

TO: Director, VA New York/New Jersey Veterans Healthcare Network (10N3)

SUBJECT: Healthcare Inspection – Alleged Telemetry Unit Deficiencies, VA New York Harbor Healthcare System, New York, New York

Purpose

The VA Office of Inspector General (OIG) Office of Healthcare Inspections conducted an inspection to assess the merit of an allegation made by a complainant concerning quality of care of a patient on a telemetry unit at the Manhattan Campus, New York Harbor Healthcare System (the facility), New York, NY. During the inspection, we also reviewed progress on corrective actions taken to address deficiencies related to a prior incident on another telemetry unit 6 months earlier, which the OIG addressed in an October 2011 report.

Background

VA New York Harbor Healthcare System

The facility is part of Veterans Integrated Service Network (VISN) 3 and comprises three campuses located in Manhattan, Brooklyn, and Queens. The Manhattan Campus has bed services in acute medicine, surgery, acute psychiatry, neurology, and rehabilitation medicine. The campus is the VISN 3 referral center for interventional cardiology, cardiac surgery, and neurosurgery.

Telemetry unit 4 West (4W), is a 25-bed unit that admits hemodynamically¹ stable post-surgical patients, usually from the surgical intensive care unit (SICU). If necessitated by census demands, 4W may admit patients from the medical intensive care unit or the cardiac care unit. The unit also admits post-surgical patients who do not require telemetry monitoring.

The step-down unit located on 4W (4W/SDU) accommodates patients in need of closer monitoring and has four of the unit's beds arranged in view of a nursing station in a single room.

¹ Hemodynamically stable indicates that the circulatory system is functioning well enough to provide adequate blood flow throughout the body.

Allegation

In mid November 2011, a complainant contacted the OIG's Hotline Division and alleged that a possible equipment malfunction or a lack of continuous telemetry monitoring may have contributed to a patient's death in June 2011.

Prior OIG Review

In April 2011, the OIG received allegations concerning the medical telemetry unit at this facility. Our prior review² could neither confirm nor refute the allegation that a patient on the telemetry unit was not continuously monitored due to a disconnected telemetry lead. However, we found that the unit had two system weaknesses that increased the risk of patients not being adequately monitored. Specifically, medical record documentation by unit staff did not meet industry or facility requirements, and telemetry unit nursing and biomedical engineering staff were not trained to properly use the telemetry monitoring equipment. We made two recommendations, that the facility director:

- Implement procedures to ensure that telemetry unit nursing staff comply with industry standards and system policies on charting and telemetry documentation to maintain a timely, complete, and accurate medical record for each patient.
- Ensure that telemetry unit nursing and biomedical engineering staff receive initial and refresher training on the telemetry monitoring system in accordance with Veterans Health Administration and facility policies.

Overview of Telemetry Monitoring for Cardiac Patients

Telemetry monitoring provides a continuous electrocardiogram (ECG) reading of the heart's electrical activity through external electrodes placed on the patient's body. The electrodes transmit segments of ECG data to a remote surveillance device typically located at a centralized nurses' station. The centralized surveillance device continuously analyzes patients' electrical heart rhythms according to preprogrammed parameters. Some readings, such as a rapid or slow heart rate, will trigger audible alarms. Staff is able to observe the telemetry data, acknowledge the alarms, and respond to the patient to provide immediate care should emergencies arise. The telemetry monitoring equipment at the facility triggers three types of audible alarms:

- **Red Alarm** is an audible critical alarm that is loud and continuous. It indicates the need to immediately check on a patient's status and vital signs.

² *Alleged Telemetry Unit Deficiencies VA New York Harbor Healthcare System New York, NY, 11-02545-15, October 27, 2011*

- **Yellow Alarm** is a quieter and intermittent audible alarm that stops after several minutes. It indicates a temporary irregularity in the heart rate or rhythm that is not immediately critical.
- **Blue Alarm** is similar to the yellow alarm and indicates a problem with the system itself or an improperly connected, or disconnected, telemetry lead.

Facility Policy

Facility policy identified criteria for initiating telemetry monitoring on patients with various cardiac conditions.³ In this case, monitoring was required because the patient was post-surgical, having undergone a coronary artery bypass graft⁴ with aortic valve replacement⁵ and atrial fibrillation ablation therapy.⁶

According to the facility policy, registered nurses (RNs) on the unit are required to set alarm parameters according to an individual patient's needs and/or the physician's specifications and ensure that the alarms are on at all times with the volume loud enough to be heard. They must respond immediately to any alarm activation, institute appropriate intervention, and notify the physician.

Scope and Methodology

We conducted a site visit January 17–18, 2012. We interviewed the complainant, staff physicians, nursing personnel, and other clinical, supervisory, and administrative staff. We reviewed relevant facility policies and procedures, nurse training records, biomedical engineering maintenance reports, quality management documents, and the medical record of the patient identified in the complaint. We inspected both telemetry units at the facility and reviewed the functions of the telemetry equipment with nursing staff.

We also reviewed progress on corrective actions implemented by the facility to address deficiencies related to a prior incident on the medical telemetry unit 6 months earlier. The OIG made two recommendations regarding this incident in a report that was published October 27, 2011.

We conducted the inspection in accordance with *Quality Standards for Inspection and Evaluation* published by the Council of the Inspectors General on Integrity and Efficiency.

³ New York Harbor Healthcare System (NYHHS) Policy No. 111-05, *Electrocardiographic Telemetry Monitoring Protocol*, November 2008.

⁴ Coronary artery bypass graft is a surgical procedure to improve blood flow to heart tissue; it is most commonly performed by grafting a section of vein material to bypass an obstruction or narrowing of a coronary artery.

⁵ The aortic valve controls blood flow between the left lower chamber (ventricle) of the heart and the major artery (aorta) sending blood to body systems.

⁶ Atrial fibrillation is an irregular heartbeat that can cause inadequate blood circulation through the heart; ablation is a procedure using radio frequency energy to correct the fibrillation.

Case Summary

The patient was a male in his mid 80s with a past medical history that included multiple cardiac issues. He was transferred to the facility for a cardiac catheterization⁷ and aortic valve replacement for aortic stenosis.⁸ Two days after admission, the patient underwent a cardiac catheterization and was discharged in good condition. The following week, surgeons at the facility performed a coronary artery bypass graft with aortic valve replacement and atrial fibrillation ablation therapy. He was admitted to the SICU and was doing well postoperatively.

After 3 days in the SICU, the patient was transferred to telemetry unit 4W. According to nursing progress notes on the day of transfer, he was slowly ambulating with assistance and tolerating his diet, and his pain was well controlled. In the early morning of day two on 4W, a nurse noted that the patient was alert and oriented and gave him acetaminophen/oxycodone⁹ for back pain. A surgical resident who saw him later that same morning noted that he was sitting comfortably in a chair and had no complaints. In the early morning of day three, the patient complained of “head cramps” and was offered acetaminophen/oxycodone, but he requested acetaminophen without oxycodone instead.

Late in the evening of day three on 4W, the patient received two acetaminophen/oxycodone tablets after he complained of right shoulder pain. Later that same evening, the patient’s ECG monitor showed a heart rate of 37, which quickly accelerated to 130–140. The patient verbalized “feeling lousy” and was noted to be pale, sweating, and cold and clammy to touch. An ECG indicated atrial fibrillation, and the RN notified the general surgery house officer on duty. A cardiology house officer also reportedly assessed the patient and had the patient transferred from 4W to 4W/SDU at 10:55 p.m. on day three.

Nursing transfer and acceptance notes on day four indicate that the patient’s condition had improved. At 10:45 a.m., he was transferred from 4W/SDU back to 4W and was placed on telemetry monitoring. A 4W nursing progress note, in the early evening of day four, indicates that the patient was alert, oriented, able to communicate, and that a cardiovascular assessment was within normal limits.

A nursing progress note covering the time period 12:57 a.m. to 8:53 a.m. on day five indicates that at 6:34 a.m., the patient was medicated, was oriented, able to communicate, and denied chest pain or discomfort. The same progress note documents that the patient was unresponsive at 7:15 a.m., and the nurse called a cardiac arrest response team. The surgical resident also documented that the patient was found unresponsive at 7:15 a.m.,

⁷ Cardiac catheterization is the insertion of a tube into a heart chamber or vessel to either diagnose or correct a coronary problem.

⁸ Aortic stenosis is a disease process that causes the opening of the aortic valve to narrow, which in turn compromises blood flow.

⁹ Acetaminophen/oxycodone is a narcotic medication commonly prescribed for pain management.

that a cardiac arrest response was initiated, and that the team responded appropriately. The efforts at resuscitation were unsuccessful, and at 7:49 a.m., the patient was pronounced dead.

Following the patient's death, the surgical resident reviewed the telemetry system history and noted that at 5:44 a.m. on day five, the telemetry system recorded that the patient's heart rhythm was in asystole.¹⁰ There is no documentation of a response by staff to the condition of asystole until the nurse found the patient unresponsive at 7:15 a.m., indicating that the RN who interacted with the patient at 6:43 a.m. did not detect that the ECG monitor lead(s) had apparently become detached from the patient's body. Therefore, the specific time when the patient first experienced cardiac arrest is not determinable.

Inspection Results

Issue 1: Telemetry Equipment Malfunction

We did not substantiate that a telemetry equipment malfunction contributed to the patient's death. We found that the telemetry equipment was functioning properly and that biomedical engineering personnel conducted preventive maintenance in accordance with the manufacturer's specifications.

We reviewed an 8-month period of biomedical engineering records to determine the repair and preventive maintenance status of the telemetry system on 4W. One unrelated, minor service call took place 7 weeks prior to the incident. We also reviewed documentation indicating that biomedical engineering personnel checked the equipment immediately after the incident and confirmed that it had been functioning properly.

Issue 2: Lack of Continuous Monitoring

We substantiated that staff on the telemetry unit failed to respond to a patient's disconnected telemetry lead prior to his death. However, the timing of the lead becoming disconnected did not coincide with the patient's death; staff observed him to be alert and oriented an hour after the lead had become disconnected. The patient's telemetry status was not effectively monitored at the time of his death due to a lack of awareness of the disconnected lead.

An electronically generated report from the telemetry system memory indicated that the patient was appropriately connected to the system at the start of each shift during the 48-hours prior to the incident. In particular, the status report for the 12:01 a.m. to 8:00 a.m. shift on the morning of the incident confirmed that the patient, along with seven others, was being monitored by telemetry at the start of the shift.

¹⁰ Asystole is a condition where the heart has no electrical activity and, therefore, no cardiac output or blood flow. However, such an appearance on a monitor might also be caused by a disconnected monitor lead.

However, the patient's individual record, electronically stored in the telemetry system, demonstrated that the patient was in asystole late into that shift, at 5:44 a.m. Despite that indication, the medical record has no documentation that staff responded to a critical alarm or any situation involving the patient at that time. A progress note documents that a nurse medicated the patient and spoke to him at 6:34 a.m., 50 minutes after the asystole indication in the telemetry record. The note indicated the patient was alert, oriented, and denied any chest pain or discomfort. The physician's death note also recorded that a nurse and a phlebotomist spoke to the patient at about 6:45 a.m., 1 hour after the telemetry system indicated asystole. Staff failed to detect that the patient was disconnected from the ECG telemetry monitoring system at 5:44 a.m. and remained so until he was discovered unresponsive at 7:15 a.m.

Of the telemetry system's three types of audible alarm triggers, a red alarm is the most critical. This would be a loud and continuous audible alarm indicating the need to immediately check on a patient's status. When properly connected to the patient, the system would trigger a red alarm for a critical condition such as asystole.

An improperly connected, or disconnected, telemetry lead would also appear on the system monitor as asystole. However, as a "system problem" and not a physiological problem with the patient, it would trigger a less critical blue alarm. This alarm is audible but is intermittent and not as loud as a critical red alarm. The telemetry system would not characterize a disconnected lead as an equipment malfunction. Monitor leads may become disconnected inadvertently due to patient movement or perspiration. Patients may also intentionally remove monitor leads to facilitate ambulation or toileting. In such cases, the system is functioning properly but triggers a blue alarm because monitor leads are no longer connected to the patient.

Both in this incident and the earlier incident reviewed by the OIG, facility procedures did not require continuous direct monitoring of central telemetry stations by nursing staff. Instead, RNs were required to listen for alarms when they were away from the nursing station attending to patients. Patients were at risk when nurses could not hear and quickly respond to a blue alarm indicating a lead may be disconnected.

Follow-Up on Corrective Actions

To address the earlier incident reviewed by the OIG, and the similar circumstances of this latest telemetry incident, facility managers conducted a thorough and comprehensive Root Cause Analysis (RCA).¹¹

¹¹ An RCA is a formal methodology using multidisciplinary teams to identify the root causes of adverse events and then focuses on improvement of systems and processes. The VHA National Center for Patient Safety promotes Root Cause Analysis as a critical aspect in the process of improving patient safety. In addition, the Joint Commission requires an RCA be performed for all critical adverse events.

Subsequent to the internal review and the prior OIG hotline inspection, facility management initiated a comprehensive program to address all identified deficiencies:

- A procedure was established that assigns RNs to observe central monitoring stations 24 hours a day on all units that use telemetry.
- The physician order template was revised to expand the criteria for notifying physicians of a change in a patient's condition.
- The hourly telemetry checklist was revised to be patient specific and a process was established to scan the checklist and all hard copy documentation, including telemetry printouts, into the computerized patient record system.
- A new telemetry unit policy permanently established corrective actions and procedures¹² and a separate policy was created that is specific to patient care requirements on critical care units.¹³
- The facility also implemented a two-phase education program to retrain all RNs assigned to telemetry duty.

The education program implemented by the facility includes instruction provided by the equipment manufacturer and 12-lead ECG and arrhythmia recognition classes. We reviewed training records and determined that the majority of telemetry nurses had completed the training, and that managers had established February 14, 2012, as the deadline for all nurses to complete both phases.

We toured the units during each shift and interviewed the RNs assigned to observe the central monitoring stations. All confirmed that the RN assigned to observe is dedicated to this task, rotates hourly, and returns to direct patient care assignments when not on monitor duty. Each RN has three separate 1-hour assignments to observe the central monitoring station during a typical shift. All RNs interviewed demonstrated proficiency in setting and/or changing alarm parameters as ordered by a physician and in retrieving historical telemetry data from the system.

¹² New York Harbor Healthcare System (NYHHS) Policy No. 111-05, *Electrocardiographic Telemetry Monitoring Protocol*, (revised) October 2011.

¹³ New York Harbor Healthcare System (NYHHS) Policy No. 11-84, *Critical Care Electrocardiographic Telemetry Monitoring Protocol*, October 2011.

Conclusions

We did not substantiate that an equipment malfunction resulted in a lack of continuous telemetry monitoring, which contributed to a patient's death. Our interviews and review of the medical record and all relevant documents found that the telemetry equipment was functioning properly and that biomedical engineering personnel conducted preventive maintenance in accordance with the manufacturer's specifications.

We substantiated that staff on the telemetry unit failed to respond to a patient's disconnected telemetry lead in a timely manner. The patient's telemetry status was not effectively monitored at the time of his death due to a lack of awareness of the disconnected lead. However, facility management had developed and initiated a comprehensive corrective action plan to address all deficiencies identified by the previous OIG inspection. The plan includes revision of policies and procedures, improved documentation, and retraining of telemetry staff. We concluded that managers have made significant progress in all elements of the corrective action plan. We made no recommendations.

Comments

The Veterans Integrated Service Network and Facility Director concurred with the report. No further action is required.



JOHN D. DAIGH, JR., M.D.
Assistant Inspector General for
Healthcare Inspections

VISN Director Comments

**Department of
Veterans Affairs**

Memorandum

Date: 4/17/2012

From: Director, VA New York/New Jersey Veterans Healthcare Network (10N3)

Subject: **Healthcare Inspection—Alleged Telemetry Unit Deficiencies, VA New York Harbor Healthcare System, New York, NY**

To: Director, Bedford Office of Healthcare Inspections (54BN)

Thru: Director, Management Review Service (10A4A4)

1. This is to acknowledge receipt and review of the draft Healthcare Inspection report of Alleged Telemetry Unit Deficiencies for the VA New York Harbor Healthcare System, New York campus.
2. We appreciate the opportunity to comment and concur with the draft document.
3. Should you have any questions, please contact Pam Wright, RN MSN, VISN 3 QMO at 718-741-4125.



Michael A. Sabo, FACHE
Network Director

Facility Director Comments

**Department of
Veterans Affairs**

Memorandum

Date: 4/17/2012

From: Director, VA New York Harbor Healthcare System (630/00)

Subject: **Healthcare Inspection—Alleged Telemetry Unit Deficiencies, VA
New York Harbor Healthcare System, New York, NY**

To: Director, VA New York/New Jersey Veterans Healthcare
Network (10N3)

1. This is to acknowledge receipt and review of the draft Healthcare Inspection report of Alleged Telemetry Unit Deficiencies for the VA New York Harbor Healthcare System, New York campus.
2. We appreciate the opportunity to comment and concur with the draft document. Thank you for your assistance.



Martina A. Parauda
Director

OIG Contact and Staff Acknowledgments

OIG Contact	For more information about this report, please contact the Office of Inspector General at (202) 461-4720.
Acknowledgments	Jeanne Martin, PharmD, Project Leader Frank Keslof, EMT, MHA, Team Leader Thomas Jamieson, MD

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